

1 I Claim:

2
3
4 1. A laser beam ophthalmic surgery method for treating presbyopic patient by removing a portion of the
5 scleral tissue of an eye in a predetermined pattern and area, whereby the accommodation of the
6 presbyopic eye increases via the movement of the ciliary body and zonular fiber connected to the corneal
7 lens of the eye.

Y
suspensory ligaments

8 2. A laser beam ophthalmic surgery method for treating presbyopic patient by removing a portion of the
9 scleral tissue of an eye in accordance with claim 1 in which said movement of the ciliary body is provided
10 by the increase of the flexibility of said laser beam ablated said scleral tissue which is filled in by the sub-
11 conjunctiva tissue. ? ocular conjunctiva

12
13 3. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
14 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern includes at least 3
15 radial lines around the area of the cornea outside the limbus and each radial line has a dimension of about
16 (0.1 - 1.0) mm in width and (2.0 - 5.0) mm in length.

17
18 4. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
19 scleral tissue of an eye in accordance with claim 1 in which said predetermined area defined by the
20 area outside the limbus and between two circles having diameter of about 10 mm and 18 mm.

21
22 5. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
23 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern includes at least 3
24 curved lines around the area of the cornea outside the limbus.

25
26 6. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
27 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern includes a dotted
28 ring pattern around the area of the cornea outside the limbus and each dot has a size of about (0.1 - 2.0)
29 mm in diameter.

30
31 7. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
32 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern is generated by a
33 scanning mechanism.

34
35 8. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
36 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern is generated by a
37 fiber-coupled device.

1 9. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
2 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern is generated by a
3 translation device.

4
5 10. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
6 scleral tissue of an eye in accordance with claim 1 in which said predetermined pattern is generated by a
7 mask which is non-transparent to the said laser beam.

8
9 11. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
10 scleral tissue of an eye in accordance with claim 1 in which said laser beam is a ultraviolet laser having a
11 predetermined wavelength of about (0.15 - 0.36) microns.

12
13 12. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
14 scleral tissue of an eye in accordance with claim 1 in which said laser beam is an infrared laser having a
15 predetermined wavelength of about (0.9-6.0) microns.

16
17 13. A laser beam ophthalmic surgery method for treating presbyopic patient by removing portion of the
18 scleral tissue of an eye in accordance with claim 1 in which said laser beam is a short pulse solid state
19 laser having a predetermined wavelength of about (0.5-1.4) microns and a pulse width of about one
20 femtosecond to one nanoseconds.

21
22 14. A laser beam ophthalmic surgery method for treating presbyopic patient by removing a portion of the
23 scleral tissue of an eye in accordance with claim 1 in which said laser beam is delivered to said
24 predetermined area of the cornea by an optical fiber.

25
26 15. A laser beam ophthalmic surgery method for treating presbyopic patient by removing a portion of the
27 scleral tissue of an eye in accordance with claim 1 in which said scleral tissue is ablated by said laser
28 beam after the conjunctiva is open.

29
30 16. A laser beam ophthalmic surgery method for treating presbyopic patient by removing a portion of the
31 scleral tissue of an eye in accordance with claim 1 in which said scleral tissue is ablated by said laser
32 beam without opening the conjunctiva.

33
34 17. A laser beam ophthalmic surgery method for treating presbyopic patient by removing a portion of the
35 scleral tissue of an eye in accordance with claim 12 in which said laser beam is tightly focused to a spot
36 size of about (1-500) microns to selectively remove the sclera tissue underneath the conjunctiva layer.

37
Add 10